

REMARKS

In the March 9, 2007 Office Action, the Examiner rejected pending claims 1, 2, 4, 6, and 9-13 under 35 U.S.C. Section 103 (a) as being unpatentable as obvious in view of the disclosure in Tomita, U.S. Patent No. 6,201, 227 B1 (hereafter "the Tomita Patent") in view of the disclosure in Kley, U.S. Patent Application Publication No. 2002/0135755 A1 (hereafter "the Kley Application"). The Examiner also rejected pending claims 3, 5, and 7 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosure in the Kley Application and further in view of the disclosure in Sato, et al., U.S. Patent No. 6,046,448 (hereafter "the Sato, et al., Patent"). The Examiner additionally rejected pending claims 14, 15, and 18-20 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosure in the Kley Application and further in view of the disclosure in Chen, et al., U.S. Patent No. 6,169,281 B1 (hereafter "the Chen, et al., Patent"). The Examiner also rejected pending claim 16 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosures in the Kley Application and the Chen, et al., Patent further in view of the disclosure in Furukawa, et al., U.S. Patent No. 6,207,069 B1 (hereafter "the Furukawa, et al., Patent"). The Examiner additionally rejected pending claim 17 as being unpatentable as obvious in view of the

disclosure in the Tomita Patent in view of the disclosures in the Kley Application and the Chen, et al., Patent further in view of the disclosure in Normen, U.S. Patent No. 6,577,977 B1 (hereafter "the Normen Patent"). The Examiner also rejected pending claims 21, 22, and 25 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosure in the Chen, et al., Patent. The Examiner additionally rejected pending claim 23 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosure in the Chen, et al., Patent further in view of the disclosure in the Furukawa, et al., Patent. The Examiner additionally rejected pending claim 24 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosure in the Chen, et al., Patent further in view of the disclosure in the Normen Patent. The Examiner also rejected pending claim 26 as being unpatentable as obvious in view of the disclosure in the Tomita Patent in view of the disclosure in the Chen, et al., Patent further in view of the disclosure in the Kley Application. The Examiner rejected pending claim 8 but provides no reason for the rejection.

Claims 1 and 21 as amended recite "a frequency generator connected to the sensor electronics to supply an electrical signal over a range of frequencies near a resonant frequency of the oscillator, whereby the resonant frequency of the oscillator

is determined by sweeping the frequency generator from a starting frequency to an ending frequency and monitoring an output signal from the oscillator," and thus are distinguishable from the disclosure in the Tomita Patent in view of the disclosure in the Kley Application or the disclosure in the Chen, et al., Patent for at least several reasons. Specifically, Fig. 4 of the Tomita Patent cited by the Examiner in the Office Action mailed on March 9, 2007 discloses a quartz oscillator 4 that is excited by a piezoelectric oscillator 2. See the Tomita Patent, column 4, lines 3-6. As expressly disclosed in the Tomita Patent:

"When an AC voltage is applied to the PZT device [i.e., piezoelectric oscillator 2], it vibrates, forcing the quartz oscillator to vibrate." See the Tomita Patent, column 4, lines 7-9.

In contrast, amended claims 1 and 21 recite "a frequency generator connected to the sensor electronics to supply an electrical signal over a range of frequencies near a resonant frequency of the oscillator." Unlike the structure recited in claim 1, the Tomita Patent does not disclose a frequency generator connected to the sensor electronics as claimed. Instead, the above quotation from the Tomita Patent discloses that an AC signal is applied to the piezoelectric oscillator 2 that excites the quartz oscillator 4. The piezoelectric oscillator 2 does not supply an electrical signal. Instead, the piezoelectric oscillator 2 is supplied with an electrical signal. See FIG. 1 of the Tomita Patent (VOLTAGE GENERATING MEANS 3).

Therefore, the structure defined by claims 1 and 21 differs from the structure disclosed in the Tomita Patent. Furthermore, the Tomita Patent simply discloses:

"If the vibration frequency is made coincident with the resonant frequency (e.g., 32.7 kHz), the quartz oscillator resonates." See the Tomita Patent, column 4, lines 9-11.

In contrast to claims 1 and 21 which recite "a frequency generator connected to the sensor electronics to supply an electrical signal over a range of frequencies near a resonant frequency of the oscillator," the above quotation from the Tomita Patent merely states that the vibration frequency of the piezoelectric oscillator 2 is made coincident with the resonant frequency of the quartz oscillator 4 and fails to disclose or suggest to one of ordinary skill in the art how the oscillation of the piezoelectric oscillator 2 is made coincident with the resonant frequency of the quartz oscillator 4. There is no disclosure in the Tomita Patent that the AC voltage required is adjusted dependent upon manufacturing tolerances of the quartz oscillator 4 or affected by how the quartz oscillator 4 is mounted to the piezoelectric oscillator 2 within the other structure of the scanning probe microscope, such as the quartz oscillator holder 25, using an adhesive. See the Tomita Patent, column 4, lines 3-4. By providing "a frequency generator connected to the sensor electronics to supply an electrical signal over a range of frequencies near a resonant frequency of

the oscillator, whereby the resonant frequency of the oscillator is determined by sweeping the frequency generator from a starting frequency to an ending frequency and monitoring an output signal from the oscillator" as disclosed in the present application at page 17, lines 14-19, for example, the actual resonant frequency of the oscillator is precisely determined for operation of the oscillator at its resonant frequency to optimize sensitivity. See the present application at page 17, line 20 through page 18, line 3. The Tomita Patent fails to disclose or suggest a frequency generator to provide a sweep frequency for precisely determining the resonant frequency of the quartz oscillator 4 to achieve optimum sensitivity during operation. Neither the Kley Application nor the Chen, et al., Patent nor any of the other references cited by the Examiner cure the deficiency in the disclosure of the Tomita Patent to achieve optimum sensitivity during operation. Therefore, the scanning probe microscope defined by amended independent claims 1 and 21, as well as dependent claims 2-20 and 22-26, are allowable over the references cited by the Examiner.

In view of the foregoing amendments and remarks, it is submitted that the application is in condition for allowance.

Early action and allowance of the application are earnestly solicited.

Respectfully submitted,

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September 10, 2007